Input Set : A:\-90-5.app

```
3 <110> APPLICANT: Skeiky, Yasir
                                                                  Doss Not Comply
              Reed, Steven
      5
              Alderson, Mark
                                                              Corrected Diskette Needed
              Corixa Corporation
      8 <120> TITLE OF INVENTION: Fusion Proteins of Mycobacterium Tuberculosis
     10 <130> FILE REFERENCE: 014058-009050US
    12 <140> CURRENT APPLICATION NUMBER: US 09/597,796B
                                                                    PP 3,6-8
(A) 13 <141> CURRENT FILING DATE: 2001-06-20
     15 <150> PRIOR APPLICATION NUMBER: US 09/056,556
     16 <151> PRIOR FILING DATE: 1998-04-07
     18 <150> PRIOR APPLICATION NUMBER: US 09/223,040
     19 <151> PRIOR FILING DATE: 1998-12-30
     21 <150> PRIOR APPLICATION NUMBER: WO PCT/US99/07717
     22 <151> PRIOR FILING DATE: 1999-04-07
     24 <150> PRIOR APPLICATION NUMBER: US 09/287,849
     25 <151> PRIOR FILING DATE: 1999-04-07
     27 <150> PRIOR APPLICATION NUMBER: US 60/158,338
     28 <151> PRIOR FILING DATE: 1999-10-07
     30 <150> PRIOR APPLICATION NUMBER: US 60/158,425
     31 <151> PRIOR FILING DATE: 1999-10-07
     33 <160> NUMBER OF SEQ ID NOS: 30
     35 <170> SOFTWARE: PatentIn Ver. 2.1
     37 <210> SEQ ID NO: 1
     38 <211> LENGTH: 588
     39 <212> TYPE: DNA
     40 <213> ORGANISM: Mycobacterium tuberculosis
     42 <220> FEATURE:
     43 <223> OTHER INFORMATION: Ra35, N-terminus of MTB32A (TbRa35FL)
     45 <220> FEATURE:
     46 <221> NAME/KEY: CDS
    47 <222> LOCATION: (1)..(588)
    48 <223> OTHER INFORMATION: Ra35
    50 <400> SEQUENCE: 1
    51 geoegeegg cettgtegea ggaceggtte geogaettee eegegetgee eetegaceeg 60
    52 teegegatgg tegeceaagt ggggeeacag gtggteaaca teaacaecaa aetgggetae 120
    53 aacaacgccg tgggcgccgg gaccggcatc gtcatcgatc ccaacggtgt cgtgctgacc 180
    54 aacaaccacg tgatcgcggg cgccaccgac atcaatgcgt tcagcgtcgg ctccggccaa 240
    55 acctacggcg tcgatgtggt cgggtatgac cgcacccagg atgtcgcggt gctgcagctg 300
    56 cgcggtgccg gtggcctacc atcggcggcg atcggtggcg gcgtcgcggt tggtgagccc 360
    57 gtcgtcgcga tgggcaacag cggtgggcag ggcggaacgc cccgtgcggt gcctggcagg 420
    58 gtggtcgcgc tcggccaaac cgtgcaggcg tcggattcgc tgaccggtgc cgaagagaca 480
    59 ttgaacgggt tgatccagtt cgatgccgcg atccagcccg gtgattcggg cgggcccgtc 540
    60 gtcaacggcc taggacaggt ggtcggtatg aacacggccg cgtcctag
    63 <210> SEQ ID NO: 2
    64 <211> LENGTH: 195
    65 <212> TYPE: PRT
    66 <213> ORGANISM: Mycobacterium tuberculosis
```

Input Set : A:\-90-5.app

```
67 <223> OTHER INFORMATION: Ra35, N-terminus of MTB32A (TbRa35FL)
70 <400> SEQUENCE: 2
71 Ala Pro Pro Ala Leu Ser Gln Asp Arg Phe Ala Asp Phe Pro Ala Leu
72
                     5
                                        10
73 Pro Leu Asp Pro Ser Ala Met Val Ala Gln Val Gly Pro Gln Val Val
75 Asn Ile Asn Thr Lys Leu Gly Tyr Asn Ala Val Gly Ala Gly Thr
77 Gly Ile Val Ile Asp Pro Asn Gly Val Val Leu Thr Asn Asn His Val
        50
78
                            55
79 Ile Ala Gly Ala Thr Asp Ile Asn Ala Phe Ser Val Gly Ser Gly Gln
                        70
                                            75
81 Thr Tyr Gly Val Asp Val Val Gly Tyr Asp Arg Thr Gln Asp Val Ala
                                        90
83 Val Leu Gln Leu Arg Gly Ala Gly Gly Leu Pro Ser Ala Ala Ile Gly
                                   105
85 Gly Gly Val Ala Val Gly Glu Pro Val Val Ala Met Gly Asn Ser Gly
           115
                               120
                                                   125
87 Gly Gln Gly Gly Thr Pro Arg Ala Val Pro Gly Arg Val Val Ala Leu
                           135
89 Gly Gln Thr Val Gln Ala Ser Asp Ser Leu Thr Gly Ala Glu Glu Thr
                                           155
                       150
91 Leu Asn Gly Leu Ile Gln Phe Asp Ala Ala Ile Gln Pro Gly Asp Ser
                   165
                                       170
93 Gly Gly Pro Val Val Asn Gly Leu Gly Gln Val Val Gly Met Asn Thr
               180
                                   185
94
95 Ala Ala Ser
           195
96
99 <210> SEQ ID NO: 3
100 <211> LENGTH: 1872
101 <212> TYPE: DNA
102 <213> ORGANISM: Mycobacterium tuberculosis
104 <220> FEATURE:
105 <223> OTHER INFORMATION: MTB32A (TbRa35FL) cDNA
107 <400> SEQUENCE: 3
108 gactacgttg gtgtagaaaa atcctgccgc ccggaccctt aaggctggga caatttctga 60
109 tagctacccc gacacaggag gttacgggat gagcaattcg cgccgccgct cactcaggtg 120
110 gtcatggttg ctgagcgtgc tggctgccgt cgggctgggc ctggccacgg cgccggccca 180
111 ggcggccccg ccggccttgt cgcaggaccg gttcgccgac ttccccgcgc tgcccctcga 240
112 cccgtccgcg atggtcgccc aagtggcgcc acaggtggtc aacatcaaca ccaaactggg 300
113 ctacaacaac geogtgggeg eegggaeegg categteate gateecaaeg gtgtegtget 360
114 gaccaacaac cacgtgatcg cgggcgccac cgacatcaat gcgttcagcg tcggctccgg 420
115 ccaaacctac ggcgtcgatg tggtcgggta tgaccgcacc caggatgtcg cggtgctgca 480
116 gctgcgcggt gccggtggcc tgccgtcggc ggcgatcggt ggcggcgtcg cggttggtga 540
117 gecegtegte gegatgggea acageggtgg geagggegga acgeeeegtg eggtgeetgg 600
118 cagggtggtc gcgctcggcc aaaccgtgca ggcgtcggat tcgctgaccg gtgccgaaga 660
119 gacattgaac gggttgatcc agttcgatgc cgcaatccag cccggtgatt cgggcgggcc 720
120 cgtcgtcaac ggcctaggac aggtggtcgg tatgaacacg gccgcgtccg ataacttcca 780
121 gctqtcccaq qqtqqqcaqq qattcqccat tccqatcqqq caqqcqatqq cqatcqcqqq 840
```

Input Set : A:\-90-5.app

```
122 ccaaatccga tcgggtgggg ggtcacccac cgttcatatc gggcctaccg ccttcctcgg 900
    123 cttgggtgtt gtcgacaaca acggcaacgg cgcacgagtc caacgcgtgg tcggaagcgc 960
    124 teeggeggea agteteggea tetecacegg egacgtgate acegeggteg acggegetee 1020
    125 gatcaactcg gccaccgcga tggcggacgc gcttaacggg catcatcccg gtgacgtcat 1080
    126 ctcggtgaac tggcaaacca agtcgggcgg cacgcgtaca gggaacgtga cattggccga 1140
    127 gggacccccg gcctgatttg tcgcggatac cacccgccgg ccggccaatt ggattggcgc 1200
    128 cagccgtgat tgccgcgtga gcccccgagt tccgtctccc gtgcgcgtgg cattgtggaa 1260
    129 gcaatqaacq aqqcaqaaca caqcqttqaq caccctcccq tgcagggcag ttacgtcgaa 1320
    130 gqcqqtqtqq tcgaqcatcc ggatgccaag gacttcggca gcgccgccgc cctgcccgcc 1380
    131 gatccgacct ggtttaagca cgccgtcttc tacgaggtgc tggtccgggc gttcttcgac 1440
W--> 132 gccagcgcgg acggttccgn)cgatctgcgt ggactcatcg atcgcctcga ctacctgcag 1500
    133 tggcttggca tcgactgcat ctgttgccgc cgttcctacg actcaccgct gcgcgacggc 1560
    134 ggttacgaca ttcgcgactt ctacaaggtg ctgcccgaat tcggcaccgt cgacgatttc 1620
    135 gtcgccctgg tcgacaccgc tcaccggcga ggtatccgca tcatcaccga cctggtgatg 1680
     136 aatcacacct cggagtcgca cccctggttt caggagtccc gccgcgaccc agacggaccg 1740
    137 tacggtgact attacgtgtg gagcgacacc agcgagcgct acaccgacgc ccggatcatc 1800
W--> 138 ttegtegaea eegaagagte gaactggtea ttegateetg teegeegaea gttmetactg 1860
     139 gcaccgattc tt
                                                                           1872
     142 <210> SEQ ID NO: 4
    143 <211> LENGTH: 355
     144 <212> TYPE: PRT
     145 <213> ORGANISM: Mycobacterium tuberculosis
     147 <220> FEATURE:
    148 <223> OTHER INFORMATION: MTB32A (TbRa35FL) protein
    150 <400> SEQUENCE: 4
    151 Met Ser Asn Ser Arg Arg Ser Leu Arg Trp Ser Trp Leu Leu Ser
    153 Val Leu Ala Ala Val Gly Leu Gly Leu Ala Thr Ala Pro Ala Gln Ala
                      20
                                          25
    155 Ala Pro Pro Ala Leu Ser Gln Asp Arg Phe Ala Asp Phe Pro Ala Leu
    156
                                      40
    157 Pro Leu Asp Pro Ser Ala Met Val Ala Gln Val Ala Pro Gln Val Val
                                  55
    159 Asn Ile Asn Thr Lys Leu Gly Tyr Asn Asn Ala Val Gly Ala Gly Thr
                                                  75
                             70
     161 Gly Ile Val Ile Asp Pro Asn Gly Val Val Leu Thr Asn Asn His Val
                                              90
     163 Ile Ala Gly Ala Thr Asp Ile Asn Ala Phe Ser Val Gly Ser Gly Gln
                    100
                                         105
    165 Thr Tyr Gly Val Asp Val Val Gly Tyr Asp Arg Thr Gln Asp Val Ala
                                     120
                 115
    167 Val Leu Gln Leu Arg Gly Ala Gly Gly Leu Pro Ser Ala Ala Ile Gly
                                 135
    169 Gly Gly Val Ala Val Gly Glu Pro Val Val Ala Met Gly Asn Ser Gly
                                                 155
    170 145
                             150
    171 Gly Gln Gly Gly Thr Pro Arg Ala Val Pro Gly Arg Val Val Ala Leu
                         165
                                             170
    173 Gly Gln Thr Val Gln Ala Ser Asp Ser Leu Thr Gly Ala Glu Glu Thr
                    180
    174
                                         185
```

Input Set : A:\-90-5.app

Output Set: N:\CRF3\01152002\I597796B.raw

175 Leu Asn Gly Leu Ile Gln Phe Asp Ala Ala Ile Gln Pro Gly Asp Ser 176 195 200 177 Gly Gly Pro Val Val Asn Gly Leu Gly Gln Val Val Gly Met Asn Thr 210 215 179 Ala Ala Ser Asp Asn Phe Gln Leu Ser Gln Gly Gln Gly Phe Ala 230 235 181 Ile Pro Ile Gly Gln Ala Met Ala Ile Ala Gly Gln Ile Arg Ser Gly 245 250 183 Gly Gly Ser Pro Thr Val His Ile Gly Pro Thr Ala Phe Leu Gly Leu 260 265 185 Gly Val Val Asp Asn Asn Gly Asn Gly Ala Arg Val Gln Arg Val Val 280 275 187 Gly Ser Ala Pro Ala Ala Ser Leu Gly Ile Ser Thr Gly Asp Val Ile 295 189 Thr Ala Val Asp Gly Ala Pro Ile Asn Ser Ala Thr Ala Met Ala Asp 315 191 Ala Leu Asn Gly His His Pro Gly Asp Val Ile Ser Val Asn Trp Gln 325 330 193 Thr Lys Ser Gly Gly Thr Arg Thr Gly Asn Val Thr Leu Ala Glu Gly 345 195 Pro Pro Ala 355 196 199 <210> SEQ ID NO: 5 200 <211> LENGTH: 447 201 <212> TYPE: DNA 202 <213> ORGANISM: Mycobacterium tuberculosis 204 <220> FEATURE: 205 <223> OTHER INFORMATION: MTBRal2 C-terminus of MTB32A (Ra35FL) 207 <400> SEQUENCE: 5 208 cqqtatqaac acqqccqcqt ccqataactt ccaqctqtcc caggqtqgqc agggattcgc 60 209 catteegate gggeaggega tggegatege gggeeagate egategggtg gggggteace 120 210 caccettcat ategggeeta eegeetteet eggettgggt gttgtegaca acaacggeaa 180 211 eggegeacga gtecaaegeg tggtegggag egeteeggeg geaagteteg geateteeae 240 212 eggegaegtg ateaeegegg tegaeggege teegateaac teggeeaeeg egatggegga 300 213 egegettaac gggcatcatc ceggtgaegt cateteggtg aactggcaaa ccaagteggg 360 214 eggeaegegt acagggaaeg tgacattgge egagggaeec eeggeetgat ttegtegygg 420 215 ataccacccg ccggccggcc aattgga 447 218 <210> SEQ ID NO: 6 219 <211> LENGTH: 132 220 <212> TYPE: PRT 221 <213> ORGANISM: Mycobacterium tuberculosis 223 <220> FEATURE: 224 <223> OTHER INFORMATION: MTBRal2 C-terminus of MTB32A (Ra35FL) 226 <400> SEQUENCE: 6 227 Thr Ala Ala Ser Asp Asn Phe Gln Leu Ser Gln Gly Gln Gly Phe 228 10 1 229 Ala Ile Pro Ile Gly Gln Ala Met Ala Ile Ala Gly Gln Ile Arg Ser 231 Gly Gly Gly Ser Pro Thr Val His Ile Gly Pro Thr Ala Phe Leu Gly

Input Set : A:\-90-5.app

```
232
             35
                                 40
233 Leu Gly Val Val Asp Asn Asn Gly Asn Gly Ala Arg Val Gln Arg Val
234
235 Val Gly Ser Ala Pro Ala Ala Ser Leu Gly Ile Ser Thr Gly Asp Val
236 65
                         70
237 Ile Thr Ala Val Asp Gly Ala Pro Ile Asn Ser Ala Thr Ala Met Ala
239 Asp Ala Leu Asn Gly His His Pro Gly Asp Val Ile Ser Val Asn Trp
240
                100
                                    105
241 Gln Thr Lys Ser Gly Gly Thr Arg Thr Gly Asn Val Thr Leu Ala Glu
            115
                                120
242
243 Gly Pro Pro Ala
        130
247 <210> SEO ID NO: 7
248 <211> LENGTH: 3058
249 <212> TYPE: DNA
250 <213> ORGANISM: Mycobacterium tuberculosis
252 <220> FEATURE:
253 <223> OTHER INFORMATION: MTB39 (TbH9) cDNA full-length
255 <400> SEQUENCE: 7
256 gategtaeee gtgegagtge tegggeegtt tgaggatgga gtgeaegtgt etttegtgat 60
257 ggcataccca gagatgttgg cggcggcggc tgacaccctg cagagcatcg gtgctaccac 120
258 tgtggetage aatgeegetg eggeggeece gaegaetggg gtggtgeece eegetgeega 180
259 tgaggtgteg gegetgaetg eggegeaett egeegeaeat geggegatgt ateagteegt 240
260 gagegetegg getgetgega tteatgaeca gttegtggee accettgeea geagegeeag 300
261 ctcgtatgcg gccactgaag tcgccaatgc ggcggcggcc agctaagcca ggaacagtcg 360
262 gcacqagaaa ccacqagaaa tagggacacg taatggtgga tttcggggcg ttaccaccgg 420
263 agatcaacte egegaggatg taegeeggee egggttegge etegetggtg geegeggete 480
264 agatqtqqqa caqcqtqqcq agtqacctqt tttcqqccqc gtcqqcqttt cagtcqqtqg 540
265 tetggggtet gaeggtgggg tegtggatag gttegtegge gggtetgatg gtggeggegg 600
266 cetegeegta tgtggegtgg atgagegtea eegeggggea ggeegagetg acegeegeee 660
267 aggtccgggt tgctgcggcg gcctacgaga cggcgtatgg gctgacggtg cccccgccgg 720
268 tgatcgccga gaaccgtgct gaactgatga ttctgatagc gaccaacctc ttggggcaaa 780
269 acaccccqqc qatcqcqqtc aacqaqqccq aatacqqcqa gatqtqqqcc caagacqccg 840
270 ccgcgatgtt tggctacgcc gcggcgacgg cgacggcgac ggcgacgttg ctgccgttcg 900
271 aggaggegee ggagatgace agegegggtg ggeteetega geaggeegee geggtegagg 960
272 aggeeteega caeegeegeg gegaaceagt tgatgaacaa tgtgeeeeag gegetgeaac 1020
273 agctggccca gcccacgcag ggcaccacgc cttcttccaa gctgggtggc ctgtggaaga 1080
274 eggtetegee geateggteg eegateagea acatggtgte gatggeeaac aaccacatgt 1140
275 cgatgaccaa ctcgggtgtg tcgatgacca acaccttgag ctcgatgttg aagggctttg 1200
276 ctccqqcqqc qqccqcccaq qccqtqcaaa ccqcqqcqca aaacgqqqtc cgqgcqatga 1260
277 getegetggg eagetegetg ggttettegg gtetgggegg tggggtggee geeaacttgg 1320
278 gtcgggcggc ctcggtcggt tcgttgtcgg tgccgcaggc ctgggccgcg gccaaccagg 1380
279 cagtcacccc ggcggcgcgg gcgctgccgc tgaccagcct gaccagcgcc gcggaaagag 1440
280 ggcccgggca gatgctgggc gggctgccgg tggggcagat gggcgccagg gccggtggtg 1500
281 ggctcagtgg tgtgctgcgt gttccgccgc gaccctatgt gatgccgcat tctccggcgg 1560
282 ceggetagga gagggggge agactgtegt tatttgacca gtgateggeg gteteggtgt 1620
283 ttccgcggcc ggctatgaca acagtcaatg tgcatgacaa gttacaggta ttaggtccag 1680
284 gttcaacaag gagacaggca acatqqcctc acgttttatg acggatccgc acgcgatgcg 1740
```

<210>	10	
<211>	596	
<212>	PRT	`, , , ,
<213>	Artificial Sequence \\ \(\) \/ 207	Euslit th
<223>	PRT Artificial Sequence Description of Artificial Sequence:fusion PRT Artificial Sequence Description of Artificial Sequence:fusion PRT Artificial Sequence PRT Artificial Sequence PRT Artificial Sequence	mardator
<400>	10	runeve id
		wherever &
		n 2223

The types of errors shown exist throughout the Sequence Listing. Please check subsequent sequences for similar errors.

```
<210> 25
<211> 851
<212> DNA
<213> Mycobacterium tuberculosis
<220>
<223> MTB39 (TbH9) cDNA
<400> 25
ctgcagggtg gcgttggatga gcgtcaccgc ggggcaggcc gagctgaccg ccgcccaggt 60
cogggttgct gcqgcgcct acgagacggc gtatgggctg acggtgcccc cgccggtqat 120
cqccqaqaac cqtqctqaac tqatqattct gatagcqacc aacctcttgg ggcaaaacac 180
cccggcgatc gcggtcaacg aggccgaata cggcgagatg tgggcccaag acgccgccgc 240
gatgtttggc tacgccgcgg cgacggcgac ggcgacggcg acgttgctgc cgttcgagga 300
ggcgccggag atgaccagcg cgggtgggct cctcgagcag gccgccgcgg tcgaggaggc 360
ctccqacacc gccqcqqcqa accaqttqat qaacaatqtq ccccaqqcqc tqaaacaqtt 420
ggcccagccc acgcagggca ccacgccttc ttccaagctg ggtggcctgt ggaagacggt 480
ctcgccgcat cggtcgccga tcagcaacat ggtgtcgatg gccaacaacc acatgtcgat 540
qaccaactcq qqtqtqtcqa tqaccaacac cttqaqctcq atqttqaaqq qctttqctcc 600
ggcggcggcc gcccaggccg tgcaaaccgc ggcgcaaaac ggggtccggg cgatgagctc 660
gctgggcagc tcgctgggtt cttcgggtct gggcggtggg gtggccqcca acttgggtcg 720
ggcggcctcg gtacggtatg gtcaccggga tggcggaaaa tatgcanagt ctqqtcqqcg 780
                                                                       Jeen 9
on Ever
Summany
Sheet
gaacggtggt ccggcgtaag gtttaccccc gttttctgga tgcggtgaac ttcgtcaacg 840
                                                                   851
gaaacagtta c
```

Important

Use of n and/or Xaa has been detected in the Sequence Listing. Review the Sequence Listing to insure a corresponding explination is presented in the <220> to <223> fields of each sequence using n or Xaa.

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/597,796B

DATE: 01/15/2002 TIME: 12:32:11

Input Set : A:\-90-5.app

Output Set: N:\CRF3\01152002\I597796B.raw

L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date L:132 M:258 W: Mandatory Feature missing, <221> not found for SEQ ID#:3 L:132 M:258 W: Mandatory Feature missing, <222> not found for SEQ ID#:3 L:132 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 L:138 M:258 W: Mandatory Feature missing, <221> not found for SEQ ID#:3 L:138 M:258 W: Mandatory Feature missing, <222> not found for SEQ ID#:3 L:138 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 L:421 M:258 W: Mandatory Feature missing, <220> FEATURE: L:508 M:280 W: Numeric Identifier already exists, Organism not replaced. L:535 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:11 L:572 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:11 L:580 M:258 W: Mandatory Feature missing, <220> FEATURE: L:788 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 L:798 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 L:804 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 L:805 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 L:1082 M:258 W: Mandatory Feature missing, <221> not found for SEQ ID#:25 $L:1082 \ M:258 \ W:$ Mandatory Feature missing, <222> not found for SEQ ID#:25 L:1082 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:25 L:1126 M:258 W: Mandatory Feature missing, <221> not found for SEQ ID#:26 L:1126 M:258 W: Mandatory Feature missing, <222> not found for SEQ ID#:26 L:1126 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:26 L:1181 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:27